

P96024

18

CLAIMS

- 1 A pen-type injector comprising a housing;
a cartridge containing medicinal product, the cartridge being retained within the
5 housing;
means for selecting a dose of medicinal product to be expelled;
means for expelling the selected dose of medicinal product;
characterised in that the housing comprises a unitary housing within which the
dose selecting means and the dose expelling means are moveably retained.
10
- 2 A pen-type injector comprising
a piston rod having a screw thread;
an insert located in the housing and through which the piston may rotate;
ratchet means associated with the insert to ensure the piston only rotates in a
15 single direction through the insert;
a dose dial sleeve rotatable with respect to the housing and the insert;
a drive sleeve which is axially displaceable but not rotatable with respect to the
piston rod;
a button located on the drive sleeve and rotatable with respect to the drive
20 sleeve; and
clutch means which upon depression of the button prevents rotation between the
dose dial sleeve and the drive sleeve.
- 3 An injector according to claim 2, characterised in that the injector further
25 comprises a nut which is rotatable with respect to the drive sleeve and axially
displaceable but not rotatable with respect to the dose dial sleeve.
- 4 An injector according to claim 2 or claim 3, characterised in that the insert
comprises a web having an opening, a first cylindrical portion extending from a
30 first side of the web, a second cylindrical portion extending from a second side of
the web and a third cylindrical portion extending from a second side of the web.

P96024

19

5 An injector according to claim 2, characterised in that the insert comprises a web having an opening, a first cylindrical portion extending from a first side of the web, a boss provided on a second side of the web and a cylindrical portion extending away from the web about a periphery of the boss.

5

6 An injector according to claim 2, characterised in that the insert comprises a web having an opening, a first cylindrical portion extending from a first side of the web, a boss provided on a second side of the web, a radial flange extending from the boss, the radial flange being spaced from the web, and a cylindrical
10 portion extending away from the web about a periphery of the radial flange.

7 An injector according to any of claims 2 to 6, characterised in that the dose dial sleeve comprises a first section of first diameter and a second section of second diameter, the insert and an inner surface of the first section being
15 provided with interengaging features to provide a helical thread between the insert and the dose dial sleeve.

8 An injector according to any of claims 2 to 4, characterised in that the dose dial sleeve comprises a first cylindrical portion rigidly connected to a second
20 generally cylindrical portion, an inner surface of the first section and an outer surface of the cylindrical portion of the insert are provided with interengaging features to provide a helical thread between the insert and the dose dial sleeve.

9 An injector according to claim 8, characterised in that the second generally
25 cylindrical portion comprises a first cylindrical section and a second cylindrical section connected by a shoulder, the first section being rigidly keyed to an inner surface of the first portion of the dose dial sleeve, and the second section being of the same outer diameter as the housing.

30 10 An injector according to claim 8, characterised in that the second generally cylindrically portion comprises a first cylindrical section and a second cylindrical section connected by a radial flange extending from a part of the second section, the first section being rigidly keyed to an inner surface of the first portion of the

P96024

20

dose dial sleeve, and the second section being of the same outer diameter as the housing.

- 11 An injector according to any of claims 2 to 10, characterised in that an
5 outer surface of the dose dial sleeve is provided with graphics and the housing is provided with an aperture or window through which a portion of the graphics may be viewed.
- 12 An injector according to any of claims 2 to 11, characterised in that the
10 drive sleeve comprises a first part of first diameter located between the insert and the piston rod and a second part of second diameter located between the piston rod and the dose dial sleeve, an internal surface of the drive sleeve being splined to the piston rod such that no relative rotation may occur between these parts, only longitudinal displacement.
- 13 An injector according to claim 12, characterised in that the central
15 receiving area includes at a first end a centrally located domed part.
- 14 An injector according to any of claims 2 to 13, characterised in that the nut
20 is provided on a helical thread provided on the drive sleeve and is located between the drive sleeve and the dose dial sleeve, the dose dial sleeve and the nut being splined together by spline means to prevent relative rotation between the nut and the dose dial sleeve.
- 15 An injector according to any of claims 2 to 14, characterised in that the
25 drive sleeve further comprises a central receiving area having a peripheral recess, the button being of generally "T" shaped configuration has a stem that is retained within the receiving area by co-operation between a peripheral bead provided on the stem retained in a peripheral recess provided in the central
30 receiving area.

P96024

21

- 16 An injector according to claim 15, characterised in that the second end of the piston rod is generally U-shaped, each of the limbs of the U-shape being received within a second part of the drive sleeve.
- 5 17 An injector according to any of claims 2 to 16, characterised in that the clutch means comprises a plurality of radially extending longitudinally directed teeth provided respectively on the dose dial sleeve and the drive sleeve.
- 10 18 An injector according to any of claims 2 to 17, characterised in that clicker means are provided between the dose dial sleeve and the drive sleeve, the clicker means comprising a plurality of longitudinally extending teeth and a flexible toothed member, one of the plurality of teeth and the toothed member being provided on the dose dial sleeve, the other being provided on the drive sleeve, relative rotation between the dose dial sleeve and the drive sleeve causing the flexible toothed member to ride over the teeth to produce a series of clicks.
- 15 19 A pen-type injector comprising a housing a piston rod having a screw thread; an insert located in the housing and through which the piston may rotate; a dose dial sleeve rotatable with respect to the housing and the insert; and a drive sleeve which is axially displaceable with respect to the housing; characterised in that a maximum angular displacement of the dose dial sleeve with respect to the housing is determined by abutment of a radially directed lug on the dose dial sleeve with a catch means on the insert.
- 20 20 A pen-type injector according to claim 19, characterised in that the radially directed lug extends parallel to a longitudinal axis of the dose dial sleeve.
- 30 21 A pen-type injector according to claim 19 or claim 20, characterised in that the catch means comprises a groove extending about a central land, the central land being wedge shaped such that a first edge extends radially less far than a

P96024

22

second opposite edge to define a sloping surface between the first edge and the second edge.